

REMARKS

The present invention is directed to the apparatus employed in Applicant's continuous process for forming noise attenuating flexible cutting line for use in rotary vegetation trimmers. That line is now the subject of Applicant's U.S. Patent No. 6,910,277 and comprises a novel twisted configuration in which two or more generally V-shaped troughs are formed that extend helically along and about the longitudinal axis of the line. To create such a line configuration, Applicant uses the assembly described and claimed in the present application to extrude two cylindrical strands of monofilament and twist the strands about each other while in a molten condition such that the strands bond together in fused seams that extend along the bottoms of the V-shaped troughs. In other embodiments of the invention, a single strand of monofilament is twisted about its longitudinal axis while in a molten condition.

The present application previously contained 37 claims. All of those claims were rejected under 35 U.S.C. §102 and/or §103 in view of various patent references that will be discussed herein. Applicant traverses those rejections. However, Claims 29-37 have been cancelled by the present Amendment as being essentially redundant. Independent Claims 1, 20 and 28 were amended to more clearly recite the claimed subject matter, and new Claims 38-44 were added. It is respectfully submitted that each of the claims now pending in the application recites patentable subject matter over the cited art.

Claims 1-4, 6, 8, 10-15, 17-18, 20-23, 25 and 27 stand rejected under 35 U.S.C. §103(a) as being unpatentable over any of Groff (4,445,838) or Israel et al. (5,609,903) in view of Cockings et al. (5,492,706) and Heck et al. (5,670,185) and further in view of Machuque (4,217,083). These rejections are respectfully traversed. Groff, Israel et al, Cockings et al. and Heck et al. all teach apparatus for forming various food items by extruding a highly viscous food product such as pretzel dough through one or more rotating dies to twist the die being extruded therethrough. In contrast, the present invention deals with the extrusion and twisting of molten monofilament to form a particularly configured noise attenuating cutting line for rotary vegetation trimmers.

In a prior Amendment filed on or about April 25, 2006, the undersigned on behalf of Applicant pointed out the substantial differences between extruding and twisting a highly viscous food product such as pretzel dough and a molten monofilament material. The Examiner notes in the present Office Action that the intended use of the apparatus is irrelevant in an apparatus claim unless further structural limitations within the claim can only perform the intended use. While such use may weigh heavily on the issue of whether or not it would be obvious to one skilled in the art to combine certain references, this distinction need not be made here with respect to the above-identified claims. Each of Claims 1-27 recites as an element a breaker plate that is disposed in a chamber within a housing below a channel communicating the chamber with a source of molten monofilament.

The claims now recite that the inclined inner portion of the breaker plate is conically-shaped, projects upwardly and directs monofilament from the channel downwardly and outwardly onto the outer planar portion of the plate where the plurality of extrusion dies are disposed. None of the prior art references teach or suggest a breaker plate having such a configuration or orientation.

The only prior art reference cited by the Examiner in the Office Action for the teaching of the claimed breaker plate is the Machuque Patent No. 4,217,083. In an earlier Office Action, several other prior art references were identified as including the claimed breaker plate. In the last Amendment dated April 24, 2006, those other references were distinguished and it was pointed out that they did not teach the claimed breaker plate. While the Machuque patent cited by the Examiner here for its disclosure of the claimed breaker, was not discussed in detail in the prior Amendment, Machuque also fails to teach the claimed breaker plate.

The Machuque patent is directed to an extrusion head for extruding food dough and, as seen for example in Figure 2, comprises a screw 17, a diffuser grid 16 having a conical recess in the upstream end, a planar downstream end and a series of horizontally extending channels 19 and 20 extending therethrough and arranged symmetrically relative to the median plane of the extrusion nozzle 15 – all with their axes parallel, and all located at the same distance from the axis of the nozzle 15 along a circular arc as shown in Figures 2-4. A pressure equalization channel 18 is positioned downstream of the diffuser grid adjacent the nozzle 15.

The entire array lies in a horizontal disposition. The Examiner cites grid 16 as constituting the claimed breaker plate.

Figures 8-10 of the Machuque patent illustrate an alternate embodiment of the extrusion head in which two nozzles are located at the end of each extruder screw. The diffuser grids 29 are again located adjacent the downstream ends of the two screws 28 of the co-rotating twin-screw extruder. A pressure equalizing chamber 31 is again positioned between the diffuser grids and the nozzles 26 and 27. The configuration of the two nozzle slots 26 and 27 is illustrated in Figure 10. The array is again horizontally disposed and the two grids 29 again have a conical recess in their upstream ends to accommodate the conical tips of the screws.

As recited in the Machuque patent, a stream of dough or other similar material is forced by the rotary movement of the screw or two counter-rotating screws into the space located between the male cone or cones which form the ends of the screws and the female cone or cones of the diffuser grid. The material is then driven through the channels in the diffuser grid or grids. The formed strands I, J, K and L (see Fig. 11) again merge together and pass through the respective elongated nozzle slots 26a, 27a, 26b and 27b, resulting in the production of perfectly flat strips. Such a configuration arrests the rotary movement imparted to the dough by the screws and converts that movement to a linear movement which in turn is imparted to each strand of dough issuing from the channels of the diffuser grid.

From the above discussion and a review of the Machuque reference, it should be quite apparent the Machuque extruder head operates differently from Applicant's and that the breaker plate employed by Applicant is quite different than the grids employed by Machuque. Applicant's claimed breaker plate includes an upwardly projecting conical inner portion that is positioned in a chamber below a channel that directs the molten monofilament from the source into the channel above the breaker plate (see Fig. 7). This configuration is now clearly set forth in all of the above-noted claims. The Machuque grids are not positioned in a chamber below a channel that directs extrudate from a source into the channel. The grids in Machuque do not include an upwardly projecting conical inner portion. To the contrary, they define conical recesses or, as described in the patent, "female cone or cones" (see col. 5, lines 18-22 and, *e.g.*, Figs. 2 and 8). The Machuque grids do not define a substantially planar outer portion as claimed. Because the upstream face of the Machuque grid is conically recessed throughout the entire face, the grids do not and could not direct extrudate from a channel outwardly onto an outer portion of a grid or plate where extrusion dies could be positioned as is also recited in the claims. Finally, the Machuque grids are vertically oriented adjacent the extrudate screw, a channel could not deliver extrudate onto the grid from above as claimed. Because neither Machuque nor any of the other cited references teach or suggest the breaker plate configuration and the orientation of the plate recited in these claims, and because there is no suggestion in the cited art to provide a breaker plate

having the claimed configuration and orientation or to modify the grids of Machuque to provide such a structure, it is submitted that the claimed subject matter is not obvious in view of the cited art. It is therefore respectfully requested that the Examiner reconsider the rejection of these claims.

With respect to the orientation of the breaker plate and related components, it is important to note that the recited orientation is not merely a matter of designer's choice. Again, Applicant is extruding a molten material and as such relies on gravity during the extrusion process. If the system were oriented horizontally as disclosed in the prior art, the molten material would merely collect in the bottom of the pressure equalization chambers due to the low viscosity of the molten material. Accordingly, the device as described and illustrated in the Machuque patent would be inoperable in Applicant's assembly. For all of the above-stated reasons, the subject matter recited in Claims 1-14, 6, 8, 10-15, 17-18, 20-23, 25 and 27 is not made obvious by the cited art.

Claims 5, 7, 9, 16, 19, 24 and 26 were all rejected under §103(a) as being unpatentable over any of Israel et al. (5,609,903) or Groff (4,445,838) in view of any of Cockings et al. (5,492,706) and Heck et al. (5,670,185). This position is also traversed. These are the same references discussed above that deal with the extrusion of highly viscous food products (notably excluding the Machuque patent). Each of these claims is dependent either directly or indirectly on independent Claim 1 or 20. As discussed above, Claims 1 and 20, and thus each of these rejected

dependent claims, contains the same recitation of the breaker plate discussed above. Quite clearly, not one of these cited references discloses a plate having the configuration recited in these claims and none was identified in the Office Action as providing such a disclosure. For the reasons stated earlier, even if the Machuque patent were added to the art relied upon in rejecting these claims, it also fails to disclose the plate recited in these claims and thus would not supply the teaching necessary to support the rejection. Accordingly, the rejection of Claims 5, 7, 9, 16, 19, 24 and 26 is not well founded.

Claims 1-6, 8, 10-18, 20-25 and 27 are similarly rejected under §103(a) in view of this same art and further in view of Machuque. For the reasons set forth earlier in the discussion of the Machuque reference, the subject matter of these claims also is not made obvious by the combined art.

Claims 7, 9, 19 and 26 were also rejected under §103(a) as being unpatentable over Groff et al., Cockings et al. and Heck et al., the above comments are equally applicable to these claims as each of Claims 7, 9, 19 and 26 recite the configuration and orientation of the breaker plate which are not found in nor suggested by the cited references.

Finally, with respect to each of Claims 1-27, it is respectfully submitted that the use of the assembly recited in those claims is relevant in distinguishing the prior art as each of those claims recites structural limitations useful in the formation of lengths of flexible noise attenuating cutting line from

molten monofilament which would not be useful in the extrusion of the extrudate of the cited art, *i.e.* highly viscous food products. If such a medium were directed into a chamber from a channel positioned above the chamber as claimed and onto the claimed breaker plate below, the viscosity of that material would prevent the material from flowing downwardly and outwardly along the inclined conical surface of the inner portion of the plate onto the outer portion in a relatively even disposition such that it could pass through the extrusion dies located in the outer portion of the breaker plate. The claimed configuration relies on the fluidity in the molten monofilament recited in the claims and would be inoperable with the extrudate of the cited art. Similarly, molten monofilament could not be successfully extruded through the apparatus disclosed in the cited prior art to form a length of flexible cutting line or any other useful product. The molten material, lacking the structural integrity of the viscous food products, would not flow along its intended extrusion path or paths. It would simply flow downwardly and collect and crystallize in pools.

For all of the above reasons, it is respectfully submitted that all of Claims 1-27 should be allowed over the cited art.

In addition to the above, Claim 28 was amended to include the recitation of structural limitations useful in the formation of flexible cutting line, but which would have no utility in the extrusion of viscous food products. Also, new Claims 38-44 have been added to the application. These claims, like amended

Claim 28, differ from Claims 1-27 in that they additionally recite other elements necessary for the formation of the cutting line from molten monofilament but totally unsuited for use in extruding the extrudate of the cited art. Those additional elements include the cooling quench bath, the guide assembly for directing molten strands of monofilament through the bath and the drive rollers for pulling the strands through the bath to effect crystallization thereof. Quite clearly, those elements, like the claimed breaker plate are not found in the cited art. Indeed, the breaker plate is also recited in varying degrees of specificity in each of Claims 28 and 38-44. While these additional elements (excluding the breaker plate) are found in Applicant's previously cited Proulx Patent No. 5,807,462, that patent clearly teaches away from the subject matter of the present claims for the reasons set forth at length in the prior Amendment on file herein.

For all of the reasons set forth above, it is respectfully submitted that each of the claims remaining in the application defines patentable subject matter over the art of record. It is respectfully requested that the Examiner reconsider his

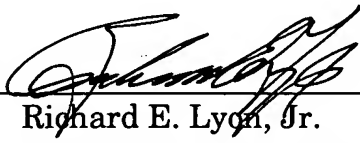
prior rejections of those claims in light of the above comments and pass the application to issue.

Respectfully submitted,

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